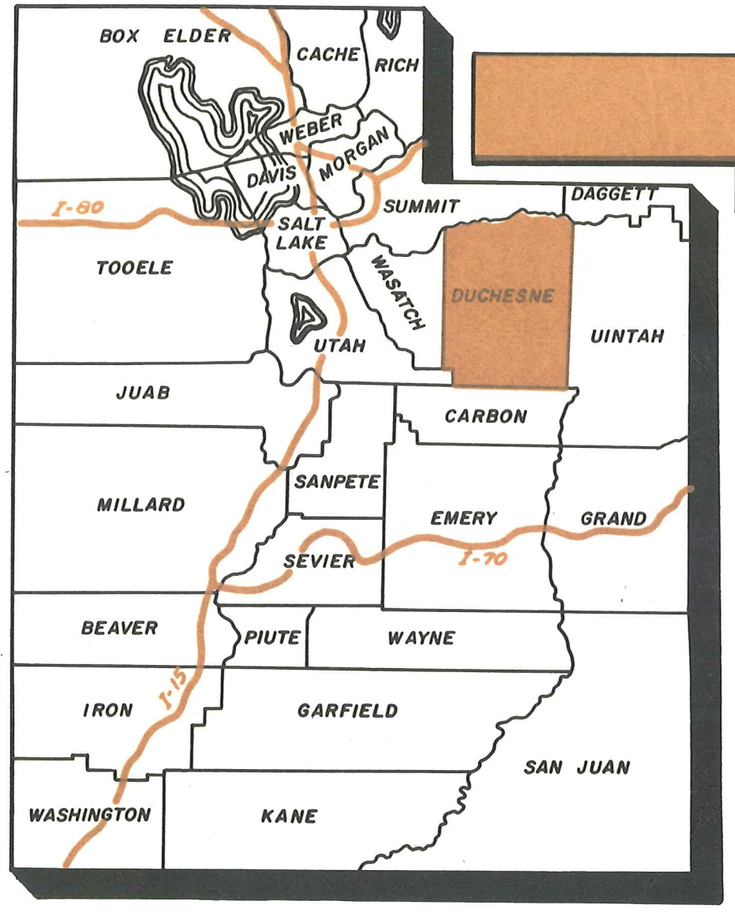


MATERIALS INVENTORY

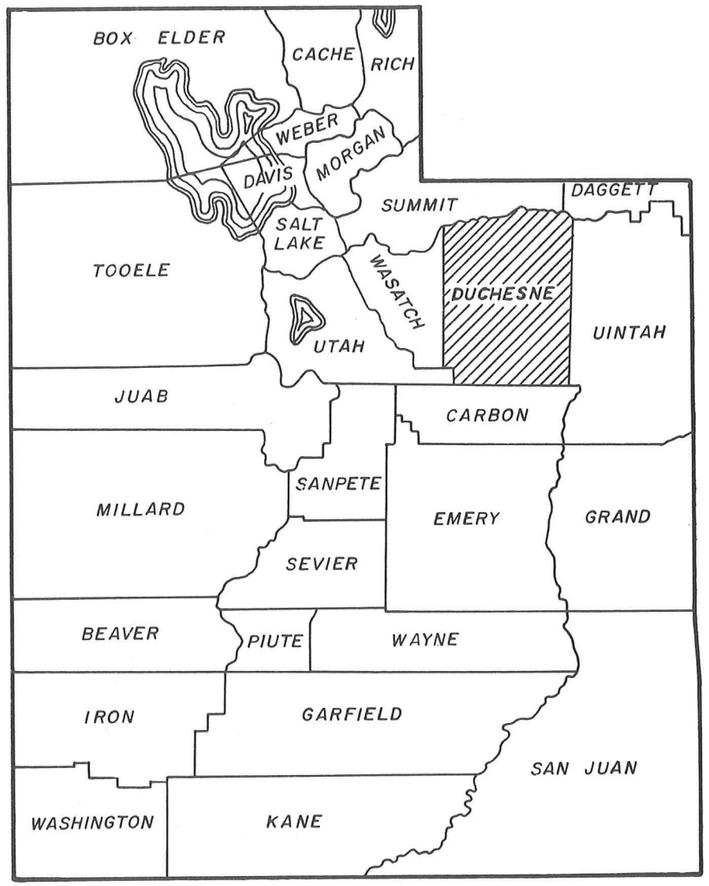
DUCHESNE COUNTY

UTAH STATE DEPT. OF HIGHWAYS
MATERIALS & RESEARCH DIVISION
MATERIALS INVENTORY SECTION

- POTENTIAL SOURCES
- PIT LOCATIONS
- TEST DATA
- GEOLOGY

MATERIALS INVENTORY

DUCHESNE COUNTY



Lithographed by the Reproduction Department,
Utah State Department of Highways

REVISED AUGUST 1971

TABLE OF CONTENTS

LIST OF FIGURES

PURPOSE

The purpose of the Materials Inventory is twofold. First, it enables the Utah State Department of Highways to more accurately locate, investigate, and catalog the materials needed for highway construction. Second, it makes possible a system by which an accessible, permanent, and up-to-date record may be kept on every known materials site.

The inventory is valuable in avoiding wasteful duplication of work in locating materials sites. General information on known materials sites and prospective sites will be available on a county basis in booklet form. More detailed information is available from a central file in the Materials Inventory Section of the Materials and Research Division and in the respective District Materials Sections.

Notwithstanding the enormous quantities of road-building materials that are now available in Utah, it must be realized that one day these materials may be depleted or completely unobtainable due to the encroachments of man. As highways improve, the quality of materials that are used in highway construction must also improve. Good quality material is not readily available in all places, and this fact alone makes it necessary to locate and secure choice sites before they are depleted or become unobtainable. The advent of the Federal Highway Program has further emphasized the necessity for large quantities of high quality material for highway construction. The Materials Inventory is designed to collect, organize and tabulate all useful information related to materials available or potentially available for highway construction.

PROCEDURES

The Materials Inventory is accomplished by a logical step by step sequence as follows:

1. Compilation of all available site data from existing files and records.
2. Acquisition of available geologic and soil map coverage of the county.
3. Plotting the above information on 1 inch = 1 mile county maps.
4. Field examination of each site to determine quantities available, to collect samples as needed, to check geologic and soil contacts, and to observe the physical setting for feasibility of material removal.
5. Preparation of the finished report.
6. Establishment of a permanent record in the Materials Division and District files to include detailed information concerning each site.

To assist in accomplishing the foregoing results, three special forms have been prepared, all of which become part of the permanent records. These forms provide details concerning the individual sites. One copy of each form is kept in the District files and one copy in the Central Materials Inventory files. The MI-1 form is designed to assist in compiling available file data and in making the field examination. A copy of this form is illustrated in Figure 1-a. It contains information relating to the approximate grading, type of material, type of deposit, rock types, surface conditions of the site (indicating obstructions to excavation, etc.), area, accessibility of the site, quantity, site number, ownership, and location. This is a specially designed form of "Needle Sort" printed by Business Forms, Inc. Notice the edges of this card. By punching or notching the card according to the code (Figure 1-b) and using the sorting needle, it is possible to rapidly sort, arrange, classify or select any information recorded on any card or group of cards in the filing system. The "Needle Sort" instruction manual gives detailed instruction as to the operation and use of this system and the reader should refer to this manual for more detailed information.

Form MI-1 is completed by the investigator as he visits each site. If laboratory test data are not available, the investigator collects a representative sample of the material, upon which laboratory tests are later performed to determine its suitability for use in highway construction.

Pertinent information from these test data is recorded on Form MI-2 (see Figure 3). This form also includes a sketch map of the deposit showing the tract subdivision, outline of the material site, drill holes, other sampled locations and information such as direction and distance from a survey station or highway. Drill hole or other sample information is logged in the columns below the sketch map.

The MI-3 form (see Figure 2) is designed to aid in the maintenance of current records. It is to be completed by the project engineer after pit operations have ceased. Included on the form are items such as quantity removed; the type, size and quality of material; and physical factors involved in pit operation.

The finished county report contains a sheet designated as "Description of Geology", describing the various geologic and soil units in detail. Following this is the "Pit Locations and Potential Sources Map". As might be inferred, this shows the location of known sites by number and symbol on a geological map, all placed on a county highway map base. The geologic information shown on the "Pit Locations and Potential Sources Map" represents a compilation from various published and unpublished sources, after field checking in pertinent areas.

MATERIALS INVENTORY FORMS

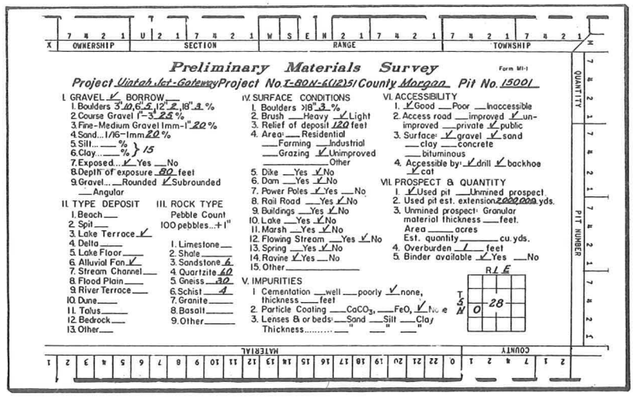


Figure 1-a. Reproduction of the Preliminary Materials Survey Form MI-1 on the Needle-Sort card. The actual card is 8 x 5 inches.

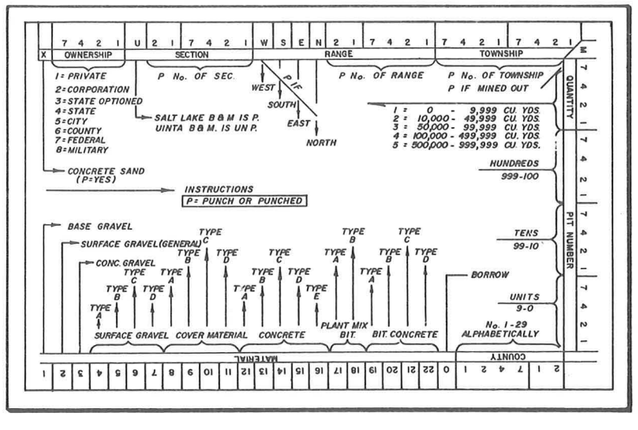


Figure 1-b. Reproduction of code card used in punching Form MI-1. The actual card is 8 x 5 inches.

PIT EVALUATION REPORT

Form MI-3
(Rev. 6-64)

To: Engineer of Materials and Research

Project Name & No._____ Date_____

Pit or Prospect No._____ Station Location_____

Legal Description_____

TYPE OF MATERIAL	MATERIALS REMOVED (CU. YDS.)
Base Gravel	
Surface Gravel (Type)	(Cu. Yds. or Tons)
Concrete Sand	
Concrete Gravel	
Bituminous Surface Course Aggregate	
Granular Backfill Underdrain	
Borrow	
Other Material (Rip Rap, Chips)	
Total Gravel Removed	

Comments:

Quality of Material_____

Uniformity of Material_____

Lenses.....gravel_____sand_____silt_____Clay Thickness_____

Amount of Oversize (+12")_____% Average thickness of Overburden_____

Estimated Quantity Remaining_____cu. yds.

Further Investigation necessary to determine remaining quantity: yes_____no_____

Features of Pit:_____

Difficulties of Operation:_____

Recommendations for Future use of Pit:_____

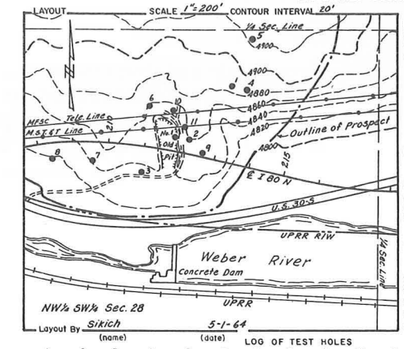
cc: District Materials Engr. By:_____
Project Engineer

Figure 2. Reproduction of the Pit Evaluation Report Form MI-3. The actual form is 8 ½ x 11 inches.

UTAH STATE DEPARTMENT OF HIGHWAYS

MATERIALS SOURCE DATA

Form MI-2



Pit No. 15-001 Project Name Uintah Jct - Gateway
Project No. I-80N-6(12)51 County Morgan State Utah
Owner U.S.A. (Wasatch National Forest)
Address

T. 4 N. 28 R. 1 E.

Property
Optioned ___ Expiration Date ___
Cost: ___ per Cu. Yd. ___ per Ton
Public Domain Set Aside ___
Date From 1964 To 1969
Prospect Only ✓

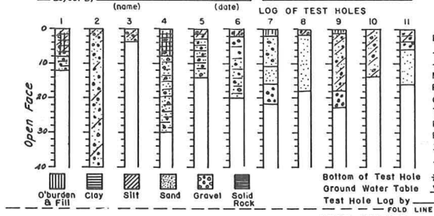
Dead Haul ___ miles to ___
or ___ miles to ___

Material	Thickness (ft.)	Quantity (cu. yds.)
Gravel	60	2,000,000
Borrow		
Overburden		

Area of Deposit 48 acres
Type of Deposit Alluvial Fan & Lake terrace
Investigations with: Drill___ Backhoe___ Cat___
Other___

LAYOUT INSTRUCTIONS: Show deposit layout, with test holes properly located and numbered. Indicate the north point, land ties, land lines and ownership. Show topography, drainage, power poles, or other obstructions to excavation. Gravel should be outlined in green, borrow in brown, and haul roads in red.

LOG OF TEST HOLES



Bottom of Test Hole *
Ground Water Table ▼
Test Hole Log by___

ADDITIONAL PIT DATA

Rock Type (% of Each) Gneiss 30 % Quartzite 60 % Sandstone 6 % Schist 4 %
Maximum Size 10"
Percent oversize (+12") - 5 %
Cementation of Deposit ✓ None ___ Partial ___ Complete.
Thickness of Cementation ___ ft.
Particle Coating None
Remarks Old pit has not been worked since early 1930's. Complete outline of prospect shown on supplementary map in Central Materials Inventory file.

FOLD LINE

TEST VALUES

GRAVEL

Test Hole No. Field Sample Number	Laboratory Number	Sample Depth (ft)	Sieve Analysis (% Passing) Before Crushing 3"	2"	1"	¾"	No.4	After Crushing 1"	¾"	½"	⅜"	No.4	No.8	No.10	No.30	No.50	No.200	Liquid Limit	Plasticity Index	Swell	Absorption	Wear L.A. Rattler	No.804 5.555 4" +	- 4	Crushed Face Count	ICT-1 Ave PSI Lime	W. Lime	ADDITIONAL INFORMATION
Col. Bank	214-SA-64	0-30	98.7	93.9	80.7	52.6	39.2	100.0	98.3	73.4	60.3	43.1	33.1	25.0	18.2	6.3	182	N.P.	.007	0.28	3.1.1	6.97	10.06	93	171	250		
T	287-SA-64	05-9	98.6	90.7	74.9	56.4	44.0	100.0	96.1	81.1	70.9	53.2	41.7	31.5	16.1	6.7	17	N.P.	.005	0.53	31.0	2.59	9.06	90	128	153		
T	288-SA-64	5-5.6 ft.	98.5	84.8	67.2	52.4	43.2	100.0	93.6	78.3	69.5	55.7	47.9	42.9	31.7	5.4	19	N.P.	.011	0.64	24	7.22	2.83	85	146	202		

BORROW

Test Hole No. Field Sample Number	Laboratory Number	Sample Depth (ft)	Laboratory Values Percent Passing Maximum Size	¼ > 3"	3"	2"	1½"	1"	¾"	No.4	No.10	No.20	No.40	No.200	Percent Gravel	Coarse Sand	Fine Sand	Silt - Clay	C.B.R. Liquid Limit	Plasticity Index	Min. % Std.	Dry Den. lb/ft³	Swell	Proctor Opt. % Moist.	Dry Den. lb/ft³	Classification A.A.S.H.O.

Samples Submitted by ___ (name) ___ (date) Test Data Added by ___ (name) ___ (date)

Figure 3. Reproduction of the Materials Source Data Form MI-2. The actual form is 11 x 17 inches.

Test information for samples obtained from each site is summarized on the "Test Data Sheet", with the corresponding pit number for identification.

Through proper use of the geologic maps, the description of geologic units, and test information, the locations of additional possible sites may be inferred.

Certain pits may contain both gravel and borrow material, making it difficult in many cases to label the material collected as representative of the pit. This also leaves some doubt as to whether a pit should be called a gravel pit or a borrow pit. As a general rule, it is assumed that any pit capable of producing gravel can be used for borrow if conditions warrant. Consequently, a pit capable of producing satisfactory gravel is normally shown as a gravel pit on the "Pit Locations and Potential Sources Map" even though it may be primarily used for borrow.

In many areas, especially where quality gravels are scarce, many deposits are investigated and sampled only to find that they do not meet standard specifications. In order to avoid wasteful duplications in re-investigating and re-sampling these deposits, they are shown as "Sites Out of Specifications" on the "Pit Locations and Potential Sources Map". The gravel in these deposits does not meet specifications for one or more of the following tests: wear, swell, liquid limit, plastic index, sodium sulfate loss, or immersion-compression. Grading is seldom a reason for gravel being out of specifications because it is assumed that any coarse aggregate can be processed to meet design specifications by crushing, blending, or wasting certain fractions of the material.

In some areas of Utah these "Sites Out of Specifications" have been used for base, surface gravel and riprap because they are the best or only source of material available. Consequently, many of these deposits will be used in future construction.

REPORT PREPARATION

Field investigations for the Duchesne County Materials Inventory were conducted by geologists from the Materials Inventory Section, Materials and Tests Division, Utah State Highway Department. Material deposits were investigated and mapped during November, 1966 and August, 1967.

The geology shown on the "Pit Locations and Potential Sources Map" is based primarily on the Northeast Quarter of the Geologic Map of Utah which was compiled by W. Lee Stokes and published by the Utah Geological and Mineralogical Survey in 1961.

GEOLOGICAL ASPECTS

Duchesne County, covering an area of 3,240 square miles, occupies a part of two physiographic provinces. That portion lying north of the foothills of the Uinta Mountains is in the Middle Rocky Mountain Province. From the foothills south is in the Colorado Plateaus Province. This area comprises the largest part of the county. It is both a synclinal and topographic basin. The county can be subdivided into five geomorphic units (see physiographic map, page 5).

The county is drained by the Duchesne River and its tributaries. This river flows in an easterly direction approximately along the axis of the synclinal basin until it joins the Green River near Ouray in Uintah County. Elevations range from 5,100 feet near Roosevelt to over 9,000 feet on the south side and 10,500 feet on the north side of the basin.

The differential orogenic movements which created the basin began in Paleocene or Eocene time. These movements have resulted in an asymmetric syncline. The beds on the north limb of the syncline dip steeply to the south and the beds on the south limb dip more gradually to the north. The north limb of the syncline also forms the south limb of the Uinta Mountain anticline, the crest of which is the north boundary of the county.

All bedrock within the county is of sedimentary origin and ranges in age from the Precambrian Uinta group to Recent alluvial deposits. Except for the Paleozoic formations exposed along the south flank of the Uinta Mountain anticline, all formations exposed are Tertiary or younger.

During the Pleistocene, the Uinta Mountains were eroded very extensively by glacial action. The resultant glacial debris; moraines, etc., and the later transportation of this material by stream action towards the lower part of the basin is the principal source of road materials for the county. This material has been redeposited and now occurs as alluvial fans and abandoned river terraces.

The Mesozoic and Tertiary bedrock formations of the county are soft sandstones, siltstones and shales. They will not meet present road material specifications. Some of the massive Tertiary sandstone formations may be used as riprap simply because they can be quarried in large blocks, although they will not meet the wear or soundness specifications. Also, they occur along or near the present highway system.

Most of the Paleozoic formations will meet specifications. However, for the most part, they do not occur in the vicinity of the road system.

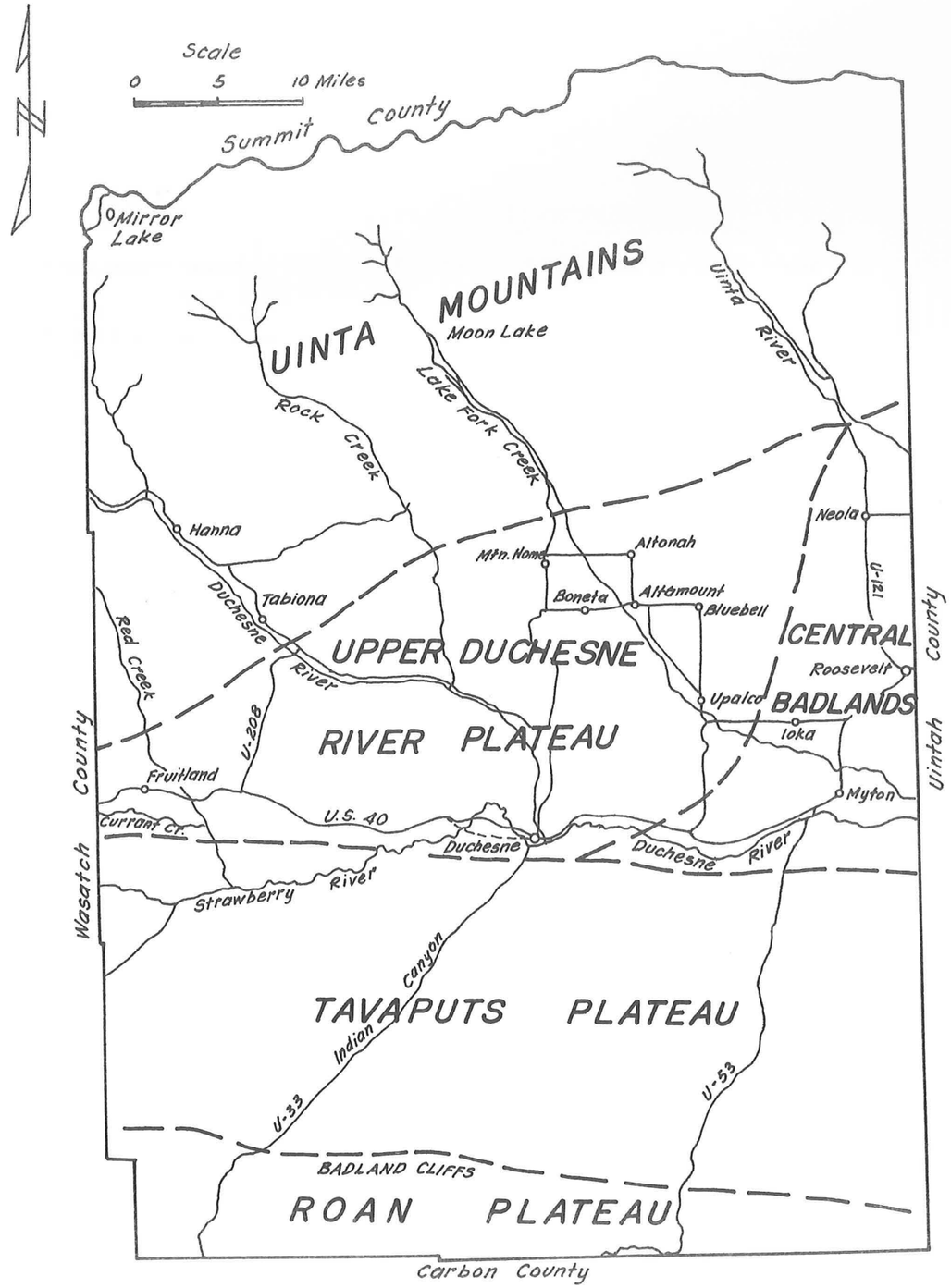
Uinta Mountains - Chiefly Precambrian, Paleozoic, and Mesozoic strata which dip steeply southwards.

Upper Duchesne River Plateau - Characterized by shallow, flat-bottomed valleys which are bordered by badland slopes and cliffs. The area is underlain by horizontal or only slightly dipping Tertiary formations.

Central Badlands - An area of river terraces and pediments which have been dissected by erosion into badland topography - mainly benches, ridges, bluffs, and slopes. The area is underlain by Early Tertiary formations.

Tavaputs Plateau - Covered by Early Tertiary formations which dip gently northwards. More resistant beds form east-west trending cuestas.

Roan Plateau - In Duchesne County this area is mainly covered by the horizontal or only slightly dipping Green River Formation.



PHYSIOGRAPHIC SUBDIVISIONS OF DUCHESNE COUNTY

DESCRIPTION OF GEOLOGY

Qar

Recent alluvium & colluvium

Alluvial fans, talus, slope wash, stream channel, and floodplain deposits which are, in general, sources of borrow. Some deposits, especially alluvial fans and stream channel deposits, contain appreciable amounts of gravel.

Qgo

Glacial outwash deposits

Fine and coarse material deposited by streams beyond margins of glaciers. Locally, these deposits contain thick beds of gravel which make good aggregate.

Tbp

Browns Park Formation

Miocene or Lower Pliocene; friable, chalk-white, gray, pink, or buff sandstones, commonly tuffaceous and occasionally cherty. Conglomerate lenses, thin-bedded tuffs, bentonite, chert beds, and concretions are locally prominent. The conglomerate beds are the only potential source of aggregate.

Tgr

Green River Formation

Middle Eocene; lacustrine sediments; mainly shale with interbedded sandstone, siltstone, limestone, dolomite, and oil shale.

Qgs

Gravel surfaces

Chiefly pediments and old river terraces; includes dissected gravel-capped knolls, ridges, and benches. These deposits are the principle sources of aggregate in Duchesne County, even though gravel in some does not meet wear or soundness specifications.

Qls

Landslide deposits

Landslides and other masses displaced by gravity; generally contain fine materials which are suitable only for borrow.

Tdr

Duchesne River Formation

Upper Eocene and Lower Oligocene; interbedded red, brown, and varicolored clay-shales, gray to buff red-weathering sandstones and some stream deposited conglomerates. This formation has a higher percentage of sandstone and conglomerate of darker, more uniform red color than the underlying Uinta Formation.

Tw

Wasatch Formation

Paleocene and Lower Eocene; red-brown, gray-green, tan, and gray shales; buff, red-brown, and gray sandstones; a few beds of gray, fresh-water limestone.

Qgm

Glaciated ground & moraines

Glaciated ground and glacial moraines of all types. Generally, the moraines consist mainly of boulders and clay.

Tgs

Gravel covered surfaces

Older, high level, gravel-covered surfaces of uncertain age. Chiefly the Gilbert Peak and Bear Mountain surfaces of the Uintah Range. Some, if not most, of these deposits contain thick beds of chiefly quartzite gravel.

Tu

Uinta Formation

Upper Eocene; light-colored stream and lake deposits of siltstone, sandstone, limestone, and shale.

Kcc

Currant Creek Formation

Upper Cretaceous; a thick sequence of mainly quartzite conglomerate beds; about 4,800 feet thick near the head of Red Creek in western Duchesne County.

Kmv

Mesa Verde Group

Upper Cretaceous; interbedded sandstone, shale, and coal beds.

Kms

Mancos Shale

Upper Cretaceous; gray, easily-eroded marine shale; forms slopes and badland topography.

Jm

Morrison Formation

Upper Jurassic; continental sediments of mainly sandstone, siltstone, and shale.

Jtc

Twin Creek Limestone

Middle and Upper Jurassic; light-gray, splintery limestone and calcareous shale with a few beds of siltstone and sandstone at the top.

Rc

Chinle Formation

Upper Triassic; red, purple, brown, and green mudstones, siltstones, and sandstones.

Kmf

Mowry Shale & Frontier Ss. undivided

These formations are undifferentiated by mapping in Duchesne County. The Mowry is Lower Cretaceous and consists of marine shale and sandy shale. The Frontier overlies the Mowry unconformably, is Upper Cretaceous, and consists of interbedded sandstone, shale, and coal.

Jsp

Stump & Preuss Sandstones

Upper Jurassic; the Stump overlies the Preuss and consists of brown-weathering, glauconitic sandstone and shale. The Preuss is chiefly red siltstone and sandstone.

Jn

Nugget Sandstone

Lower Jurassic; well-sorted, crossbedded, buff to red, quartzose sandstone of eolian origin; in most outcrops the sandstone is soft and friable and the formation weathers to rounded hills.

Rs

Shinarump Conglomerate

Middle Triassic; light-colored sandstone and some conglomerate; locally this unit is purple and red; generally 20-50 feet thick in Duchesne County. Some geologists term this unit the Gartra Member of the Chinle Formation.

Kdcm

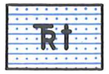
Dakota Formation & Cedar Mountain Sh. undivided

Lower Cretaceous; the Dakota consists of carbonaceous shale and light-colored sandstone. The Cedar Mountain Shale underlies the Dakota and contains chiefly nodular shale with interbedded sandstone.

Ra

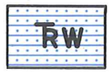
Ankareh Formation

Lower Triassic; mainly red sandstone, siltstone, and shale; unconformably underlies the Shinarump.



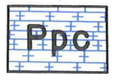
Thaynes Formation

Lower Triassic; gray, marine limestone and calcareous shale and siltstone.



Woodside Shale

Lower Triassic; red and orange siltstone and shale.



Park City Formation

Middle Permian; gray to black cherty limestone, shale, and phosphatic shale.

Morgan & Weber Formations undivided

Upper Pennsylvanian; the Weber Formation overlies the Morgan and is mainly buff and gray sandstone. The Morgan Formation is chiefly red sandstone and shale. This symbol also includes, locally, the Manning Canyon Formation which is mainly gray to black shale.

Mississippian rocks undivided

Lower and Upper Mississippian; mainly gray to black cherty limestone; includes Brazer, Madison, and Deseret Limestones.

Tintic Quartzite

Middle Cambrian; yellow to light-brown weathering quartzitic sandstone with locally interbedded pebble conglomerate and siltstone.

Red Pine Shale

Upper Precambrian; thin-bedded, brown, greenish-brown, and gray micaceous shale.

Mutual Formation

Upper Precambrian; chiefly purple and maroon quartzite with some interbedded phyllite.

Lower undifferentiated Uinta Group

Upper Precambrian; mainly buff to dark red quartzitic sandstone with some interbedded green phyllite and conglomerate.

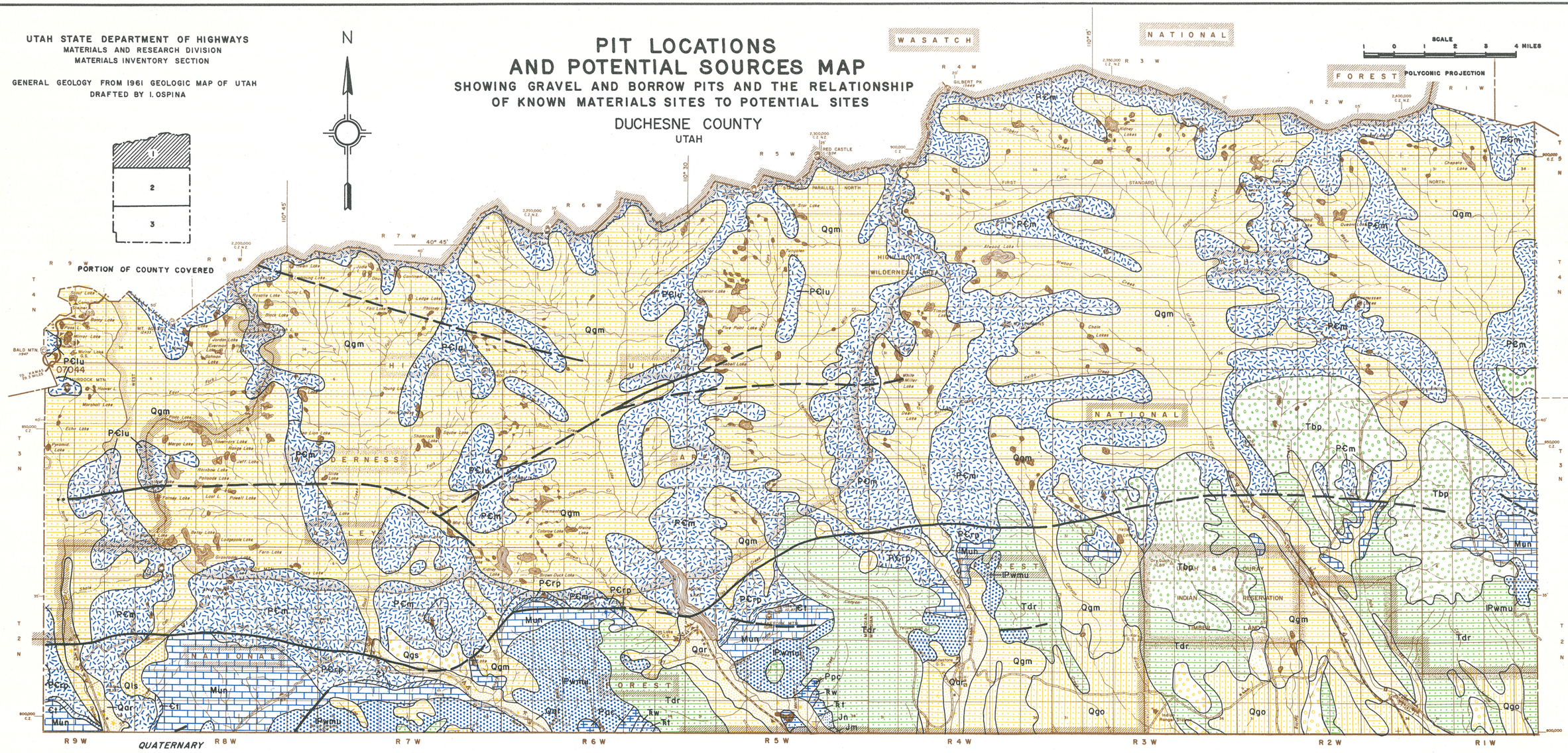
UTAH STATE DEPARTMENT OF HIGHWAYS
MATERIALS AND RESEARCH DIVISION
MATERIALS INVENTORY SECTION

GENERAL GEOLOGY FROM 1961 GEOLOGIC MAP OF UTAH
DRAFTED BY I. OSPINA

PIT LOCATIONS AND POTENTIAL SOURCES MAP

SHOWING GRAVEL AND BORROW PITS AND THE RELATIONSHIP OF KNOWN MATERIALS SITES TO POTENTIAL SITES

DUCHESNE COUNTY
UTAH



QUATERNARY
- Qar — Recent alluvium & colluvium
- Qgs — Gravel surfaces
- Qgm — Glaciated ground & moraines
- Qgo — Glacial outwash deposits
- Qls — Landslide deposits

TERTIARY
- Tgs — Gravel covered surfaces
- Tbp — Browns Park Formation
- Tdr — Duchesne River Formation
- Tu — Uinta Formation
- Tgr — Green River Formation
- Tw — Wasatch Formation

CRETACEOUS
- Kcc — Currant Creek Formation
- Kmv — Mesa Verde Group
- Kms — Mancos Shale
- Kmf — Mowry Shale & Frontier Ss. undivided
- Kdcm — Dakota Formation & Cedar Mountain Shale undivided

JURASSIC
- Jm — Morrison Formation
- Jsp — Stump & Preuss Sandstones undivided
- Jtc — Twin Creek Limestone
- Jn — Nugget Sandstone

TRIASSIC
- Rc — Chinle Formation
- Rs — Shinarump Conglomerate
- Ra — Ankareh Formation
- Rt — Thaynes Formation
- Rw — Woodside Shale

PERMIAN
- Ppc — Park City Formation

PENNSYLVANIAN
- IPwm — Morgan & Weber Formations undivided

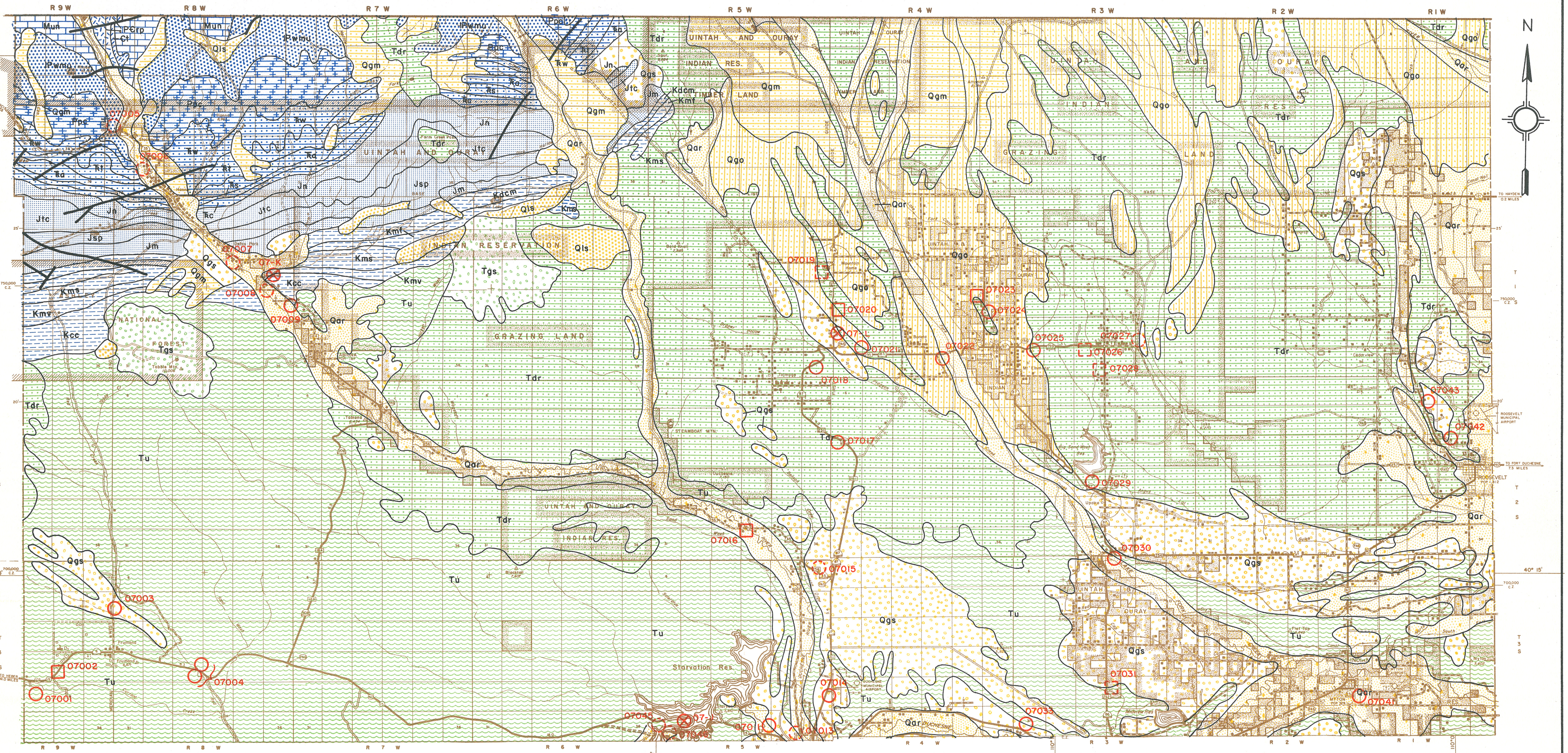
MISSISSIPPIAN
- Mun — Mississippian rocks undivided

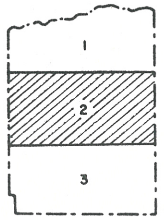
CAMBRIAN
- Ct — Tintic Quartzite

PRECAMBRIAN
- PCrp — Red Pine Shale
- PCm — Mutual Formation
- PCu — Lower undifferentiated Uinta Group

UTAH STATE DEPARTMENT OF HIGHWAYS
MATERIALS AND RESEARCH DIVISION
MATERIALS INVENTORY SECTION

GENERAL GEOLOGY FROM 1961 GEOLOGIC MAP OF UTAH
DRAFTED BY I. OSPINA





PORTION OF COUNTY COVERED

GEOLOGIC BOUNDARY
FAULT
INFERRED FAULT

PIT AND SITE CLASSIFICATION

BORROW GRAVEL

- Pit which has been worked
- Pit which has been exhausted
- Investigated site which has not been worked
- Site out of specifications

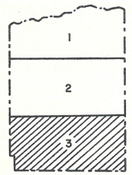
SCALE
1 0 1 2 3 4 MILES

POLYCONIC PROJECTION

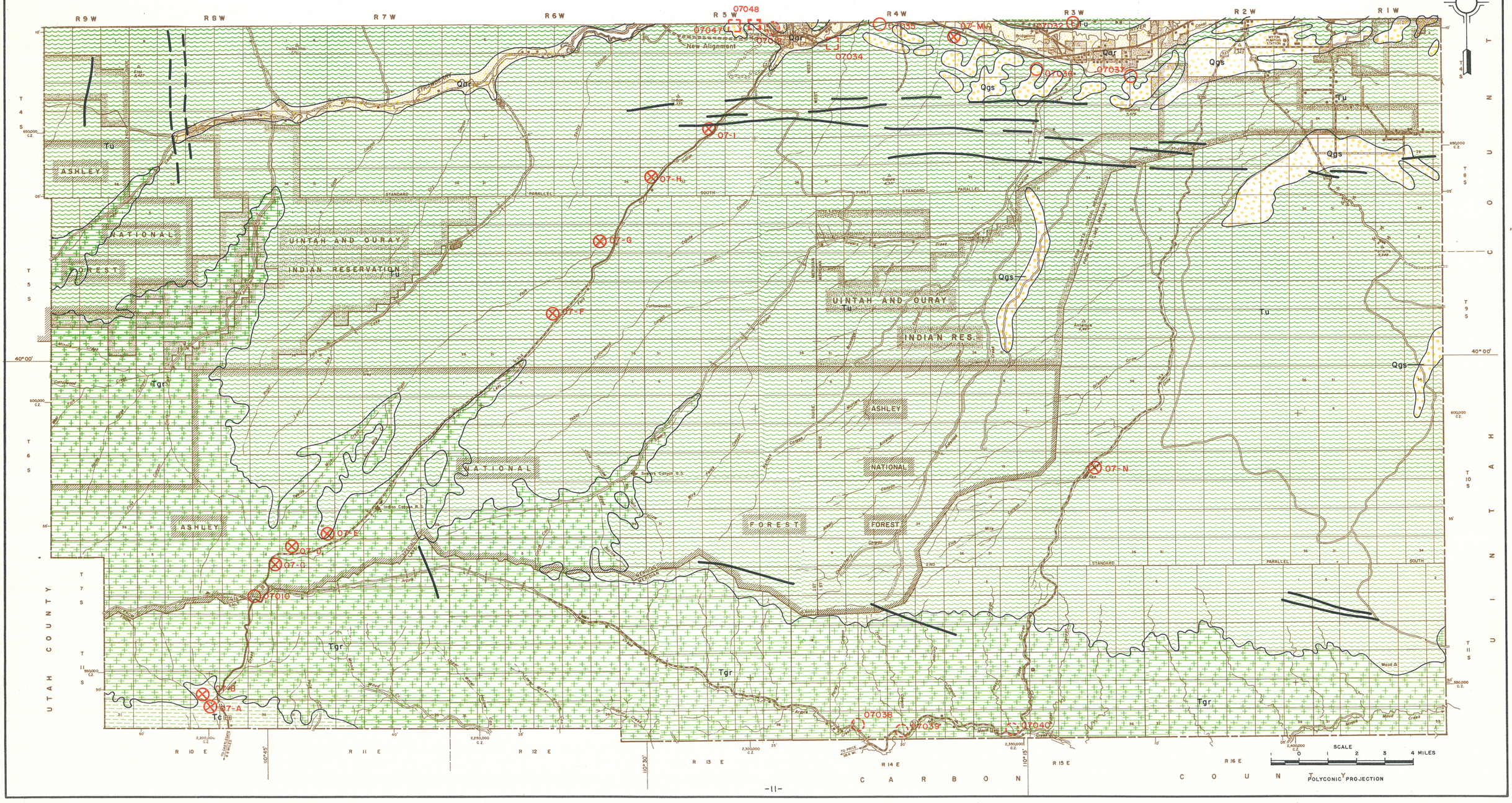
PIT LOCATIONS AND POTENTIAL SOURCES MAP

SHOWING GRAVEL AND BORROW PITS AND THE RELATIONSHIP OF KNOWN MATERIALS SITES TO POTENTIAL SITES

DUCHESNE COUNTY
UTAH



PORTION OF COUNTY COVERED



STATEMENT OF LIABILITY

No liability is expressed or implied concerning the quality or quantity of material listed for the respective sites. The data itemized are based upon sound geologic and/or geophysical interpretations in combination with tests performed upon material removed from the site, but due to the erratic depositional features of such deposits, this does not in any way guarantee that the material remaining is represented by the information obtained to date.

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA - REPRESENTATIVE SAMPLE																				
																SIEVE ANALYSIS																
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE												
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. * 10	NO. * 40	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A.A.S.H.O. CLASSIFICATION	IMMERSION COMPRESSION AVG. P.S.I. LIME WO/	IMMERSION COMPRESSION AVG. P.S.I. LIME W/	ABRASION 500 REV.	SODIUM SULPHATE LOSS +4	SODIUM SULPHATE LOSS -4
07001	3S	9W	SE	NW	27	P	Alva P. Murdock	B.G.,S.G.	River Terrace	240,000	15	0-1	1966	Cut Bank	0-4	19.0	47.5	100	59.8	34.5	27.3 *	13.4 *	7.6	17.0	N.P.		A-1-a	98	237	27.6		
07002	3S	9W	NW	SW	23	P	Ronald Lee	Borrow	Floodplain	96,000	15	0	1965	Test Hole	0-15		No Crushing 0	100		99	98	95	61	20	N.P.	0.5	A-4(5)					
07003	3S	8W	NW	SW	7	P	Coleman & Sons	B.G.,S.G.	River Terrace	360,000	10	0-2	1965	Test Hole	0-8	30.5	56.9	100	52.8	28.3	22.3 *	11.1 *	5.3	20.5	N.P.	.009	A-1-a	141	334	27.2	1.11	3.60
07004	3S	8W	NW SE	SW SE	22 21	P	R. D. Young & Sons	B.G.,S.G.	Pediment	100,000	7	0	1958	Test Hole		0	38.7	100		43.4	34.7	24.0	8.3	17.0	N.P.	.010	A-1-a			27.2		
07005	1N	8W	W½	SE	19	P	Antelope Sheep Range Company	B.G.,S.G.	River Terrace	860,000	20	0-1	1964	Test Hole	0-22	18	37	100		47	36 *	19 *	10	18	N.P.	.009	A-1-a	57	358	27	2.59	5.64
07006	1N	8W	NE	NW	32	P	Joe Curry	B.G.,S.G.	Stream Channel	240,000	15	0	1964	Cut Bank	0-40	20	40	100		49	44 *	26 *	9	15	N.P.	.013	A-1-a	71	288	24	Weighted Loss	4.59
07007	1S	8W	NW	NW	14	P	D. Fabrizio	B.G.,S.G.	Stream Channel	140,000	8	0-5	1964	Cut Bank	0-20	21	52	100		35	29 *	13 *	5	23	N.P.	.003	A-1-a	67	321	27	Weighted Loss	4.89
07008	1S	8W	NW	NW	24	P	Myrthen Moon	B.G.,S.G.	Stream Channel	220,000	13	0	1964	Cut Bank	0-6	29	60	100		34.7	28.6 *	11.2 *	3.9	18.6	N.P.	.020	A-1-a	205	289	30	4.54	8.66
07009	1S	8W	SE	SE	24	P	Ralph M. Giles	Borrow	River Terrace	Requires Investigation	10	1-2	1965	Test Hole	0-8	30	No Crushing 49	51		27	24	12	1	18	N.P.	0	A-1-a					
07010	11S	10E	S½	NW	12	F	U.S. Forest Service	B.G.,S.G.	Shaly ls. Bedrock	150,000	40	0-2	1963	Cut Bank		100		100	58.4	23.1	15.5 *	8.5 *	5.8	25	N.P.	.022	A-1-a			42.0	25.3	34.2
07011	3S	5W	NE NW	SE SW	34 35	P	Arnold Robbins	B.G.,S.G.	River Terrace	120,000	30	1-2	1960			3.6	42.8	100		47.4	39.8	27.6	4.7	19.4	N.P.	.014	A-1-a			31.4		
07012	4S	5W	NW	NE	2	P	Ute Indian Tribe	B.G.,S.G.	River Terrace	140,000	40	0	1959	Cut Bank	0-15	47.5	75.0	100		39.8	34.0	22.5	5.2	17.3	N.P.	.012	A-1-a			36.2		
07013	3S	5W	SE	SE	35	P	Ruby Stephenson	B.G.,Bor.	River Terrace	250,000	24	0-2	1960	Cut Bank	0-16	24.0	67.6	100	71.0	51.5	45.1	27.3	8.6	17.3	N.P.	.007	A-1-a			42.0		
07014	3S	5W	SE NE	NE SE	25	CO	Duchesne County	B.G.,Bor.	River Terrace	300,000	15	0	1953	Cut Bank	0-15	5.0	50.0	100	70.0	41.5	35.0	26.0	4.7	17.6	N.P.	.007	A-1-a			44.4		
07015	3S	5W	SW	NE	1	P	L. C. Winslow	B.G.,S.G.	River Terrace	240,000	6	0-1	1954			18.0	47	100	54.0	39.0	31.0	21.5	5.5	17.4	N.P.	.012	A-1-a			40.0		
07016	2S	5W	NW	NW	34	P	Willis Moon	Borrow	River Terrace	35,000	9	0	1958	Cut Bank	9'	100	100	100	100	100	99	97	5.2	19.9	N.P.	1.4%	A-4(3)					
07017	2S	4W	N½	NW	18			B.G.	River Terrace	40,000	9	0	1958	Cut Bank	9	14.2	39.1	100	70.0	57.5	53	43	5.9	16.8	N.P.	.020	A-1-a			Avg. 43.0		
07018	1S	5W	NE	SW	36	P	Arlin R. Potter	B.G.,S.G.	River Terrace	80,000	10	0-1	1955	Cut Bank	10	16	55	100	66	53	47	36	6	27.7	N.P.	.025				50.5		
07019	1S	5W	N½	SE	13	P	J.L. Stevenson	Borrow	Pediment	100,000	4	0	1959	Cut Bank	6					100	100	98	69	28	9.0	0.42	A-4-7					
07020	1S	4W	W½	SW	19	P	Aaron Stevenson	Borrow	River Terrace	200,000	6	0	1959	Test Hole	6	No 0	Crushing 32.4	67.6		54.2	49.8	42.2	13.2	18.6	N.P.	0.12	A-1-b(o)					
07021	1S	4W	NW	NW	32	P	Cecil Kofford	B.G.,Bor.	River Terrace	200,000	10	0-1	1954	Cut Bank	10	18	54	100	67	51	43	32	7	20	N.P.	0.02				47		
07022	1S	4W	SW	NE	34	P	Wm.Fieldsted	B.G.,S.G.	River Terrace	250,000	20	0-1	1954	Cut Bank	20	29	57	100	55	38	30	17	3	15.7	N.P.	.010				37		
07023	1S	4W	SE	NE	23	P	C. R. Ames	Borrow	Pediment	100,000	15	0	1959	Test Hole	4	0	No 21	Crushing 79.3		63	43	32	15	34	N.P.	0.74	A-1-b(o)					
07024	1S	4W	SW	SW	24	P	Glen Iorg	B.G.,S.G.	Pediment	100,000	10	0-1	1959	Cut Bank	10	18	53	100	52	39	32	15	6	16	N.P.	0.02				33		
07025	1S	3W	NW	NE	31	P	Bruce Hartman	B.G.,S.G.	Pediment	35,000	5	0-1	1957	Test Hole	5	8	45	100	53	40	33	22	5	26	N.P.	0.03				35		

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA - REPRESENTATIVE SAMPLE																				
																SIEVE ANALYSIS																
																BEFORE CRUSHING	PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE													
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. * 10	NO. * 40	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	IMMERSION COMPRESSION AVG. P.S.I. LIME WO/	IMMERSION COMPRESSION AVG. P.S.I. LIME W/	ABRASION 500 REV.	SODIUM SULPHATE LOSS +4	SODIUM SULPHATE LOSS -4
07026	1S	3W	NE	NW	33	P	J. W. Jackson	Borrow	Floodplain	175,000	6	0	1959	Test Hole	6	0	0				100	98	52	18.6	1.6	0.43	A-4(3)					
07027	1S	3W	SW	SW	26			B.G.,Bor.	Pediment	150,000	12	0-1	1957	Cut Bank	12	33	75	100	54	39	33	26	6	17	NP	0.03	A-1-a			49		
07028	1S	3W	SE	SE	33	P	J. L. Lisonbee	Borrow	Floodplain	80,000	3	0	1959	Test Hole	2-4					100	99	89	18	14	NP	0.0	A-2-4(0)					
07029	2S	3W	NW	SE	21			B.G.,S.G.	River Terrace	95,000	10	0				No Sample																
07030	3S	3W	NE	NW	3	P	Ray Durfey	B.G.,S.G.	River Terrace	60,000	10	0-1	1954	Cut Bank	10	36	65	100	62	46	42	34	6	16	NP	0.015				43		
07031	3S	3W	SW	NW	27	P	A. Cesspooch	Borrow	Floodplain	22,000	3	0	1956			0	No Crushing			100	99.5	96.5	42.5	24	6.1	1.6	A-4(1)					
07032	4S	3W	NW	NW	3	P	Phillip Moon	B.G.,Bor.	Pediment	Mined Out			1959	Test Hole	0-9	26	54	100		52	46	37	14	19.7	NP	.025				44		
07033	3S	3W	SW SE	SE SW	31	P	Nelson Const. Co.	B.G.,S.G.	River Terrace	170,000	5	0-1					No Sample														
07034	4S	4W	N½	SE	6	P	Loren Mitchell	Borrow	Colluvium	190,000	20	0	1960		0-40	0	No Crushing 4.4	95.6		71.2	63.2	48.2	24.6	24	2.1	.52	A-1-b(0)					
07035	4S	4W	NE	NW	4	P	Orven J. Moon	B.G.,S.G.	River Terrace	75,000	7.5	0-1	1960	Test Hole	0-5	18	49	100	74.9	47.9	40.8	32.1	11.7	25.1	NP	.007				36.2		
07036	4S	3W	E½	SE	8	P	Hackford & Moon	B.G.,S.G.	River Terrace	Investigation req'd	7.5	0-1	1960	Test Hole	0-5	15	33	100	71.4	44.0	36.8	28.4	12.9	18.9	NP	.007	A-1-a			31.0		
07037	4S	3W	SW	SW	12	P	Heirs of John M. Pekepoovits	B.G.,S.G.	River Terrace	300,000	6	0-1	1952			4	33	100		48.8	39.2	29.0	9.3	20.2	2.6	.020	A-1-a			28.9		
07038	11S	14E	NW NE	SW SE	33 32			B.G.,S.G.	Alluvial Fan	100,000	10		1953			6	26	100		45.7	29.3	15.2	6.8	21.3	NP	.013	A-1-a			39.9		
07039	11S	14E	W½	SE	34			B.G.,S.G.	Stream Channel	95,000	10	0-2	1953			14	43	100		42.7	31.5	20.0	9.7	21.0	NP	.025	A-1-a			32.0		
07040	11S	15E	W½	SE	31	P	P. Nutter Corp.	B.G.,S.G.	Stream Channel	140,000	15	0	1953			13	20	100		62.9	37.6	18.6	9.2	20.7	NP	.008	A-1-a			34.2		
07041	3S	2W	W½ E½	SE SW	25	CO P	Duchesne County Myton City	B.G.,S.G.	Stream Channel	72,000	3	0	1956		0-6	10	42	100		42.2	33.3	22.2	5.9	15.2	NP	.028	A-1-a			32.9		
07042	2S	1W	E½	NW	16	P	George Murray	B.G.,Bor.	River Terrace	115,000	12	0	1958		0-7	41	84	100		32.9	27.4	20.2	4.6	18.3	NP	.014	A-1-a			45.6		
07043	2S	1W	N½ S½	NE SE	8 5			B.G.,Bor.	River Terrace	1,900,000	10	0					Same deposit as 07042														
07044	4N	9W	SW	SW	34			B.G.,S.G.	Shale Bedrock	720,000	50	0						100	71.4	42.6	33.2		14.2	16.0	NP					37.9		
07045	3S	5W	SE	NW	31	F	Bureau of Reclamation	B.G.,S.G.	River Terrace	130,000	7	0-5	1967	Test Hole	1-8	13	40	100		41	33*	17*	9.7	17	NP	.000	A-1-a	291	372	30.9	weighted loss	7.90
07046	3S	5W	SE NE	SE SE	31	F	Bureau of Reclamation	Borrow B.G.,S.G.	River Terrace	140,000	6	0-10	1967	Test Hole	3-11	76	38	100		49	41*	25*	12.3	22	NP	.003	A-1-a	171	367	28.8	weighted loss	12.1
07047	4S	5W	N½	NW	3	P	Ute Indian Tribe	Borrow	Alluvium	400,000	12	0	1967	Test Hole	0-10	0	No Crushing 4	96		74	64	43	25	30	NP	0.1	A-1-b					
07048	4S	5W	S½	NW	2	P	Ute Indian Tribe	Borrow	Alluvium	160,000	13	0	1967	Test Hole	0-20	0	No Crushing 5	95		61	48	28	13	27	NP	0.1	A-1-a					

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES - TEST DATA SHEET

Location: Pit or Site Number	Location: Township	Location: Range	Location: 40 Acre Tract	Location: Quarter Section	Location: Section	Ownership: P = Private, C = Commercial, CO = County, F = Federal, S = State	Ownership: Owner	Material: Use of Material	Material: Type of Deposit	Material: Present Estimated Quantity (Cu. Yds.)	Material: Thickness of Material	Material: Depth of Overburden	Date Sampled *	Type of Sample	Depth of Sample	Sieve Analysis: Before Crushing > 3"	Sieve Analysis: Before Crushing > 1"	Percent Passing After Crushing to 1" Max. Size: 1"	1/2"	No. 4	No. 10*	No. 40*	No. 200	Liquid Limit	Plasticity Index	Swell	A.A.S.H.O. Classification	Immersion Compression Avg. P.S.I. Lime WO/	Lime W/	Abrasion 500 Rev.	Sodium Sulphate Loss +4	-4
07049	2S	1W	E½ SW	NW NE	7	P	D.L. Campbell	S.G., B.G.	Pediment	269,000	6	0-1	1967	Test Hole	1-6	68	No Crushing 54	45	43	39	37	28	11	23	NP		A-1-a(0)					
07050	2S	1W	W½	SE	17	P	Forrest Whipple	S.G., B.G.	River Terrace	138,000	8	0-2	1967	Cuts	2-7.5	62	37	100		59	56*	31*	8	18	NP		A-1-b(0)			58		
07051	3S	5W	NE	SW	32	F	Bureau of Rec.	Borrow BA., SA.	River Terrace	150,000	10	0-2	1967	TH	0-10	30	50	80	57	35	28	15	9	17	NP	0.02	A-1-a(0)	200	300		6	11
07052	3S	5W	NE	NE	27	F	Bureau of Rec.	BA., SA.	Pediment					CB		38	60	100	40	39	36	22	18	18	NP	0.002	A-1-b(0)	300	440		10	
07053	1N	1W	W½	SE	7	P	Joseph Yack	B.G., S.G.		400,000	20	0	1970	Test Hole	4-20	45	21	100		44	35*	19*	4.1	17	NP		A-1-a(0)	111	231	43	- 7.17 -	
07054	1S	1W	E½	SW	32	P	T.R. Harmston Mildred Norling	B.G., S.G.		220,000	10	0	1970	Test Hole	2-9	32	20	100		43	35*	18*	5	17	NP		A-1-a(0)	169	271	41	- 5.46 -	
07055	1S	1W	NW	NW	6	P	Blaine & JoAnne Horrocks	B.G., S.G.		59,000	10	0	1970	Test Pit	0-11	58.5	31.6	100		42.5	36.1*	19.5*	4.3	17	NP		A-1-a(0)			35.1		
07056	1S	2W	W½	NE	2	P	Paul & Francis Whiting	B.G., S.G.		91,000	11	0-1	1971	Test Pit	0-16	66	31.9	100		47.4	42.9*	24.3*	6.3	17	NP		A-1-a(0)			43		
07057	3S	5W	S½	NW	34	P	O.J. & Edna M. Wilkinson	B.G., S.G.		72,000	12	0-2	1971	Test Hole	2-11	78	49	100		37.9	29.3*	15.5*	6.7	16	NP	.002	A-1-a(0)		410-D 293-W	25.9	- 8.84 -	

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

PITS AND POTENTIAL SITES - TEST DATA SHEET

LOCATION						OWNERSHIP		MATERIAL					TEST DATA - REPRESENTATIVE SAMPLE																			
																SIEVE ANALYSIS												IMMERSION/ COMPRESSION AVG. P.S.I.			SODIUM SULPHATE LOSS	
																BEFORE CRUSHING		PERCENT PASSING AFTER CRUSHING TO 1" MAX. SIZE										LIME				
PIT OR SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	P = PRIVATE C = COMMERCIAL CO = COUNTY F = FEDERAL S = STATE	OWNER	USE OF MATERIAL	TYPE OF DEPOSIT	PRESENT ESTIMATED QUANTITY (CU. YDS.)	THICKNESS OF MATERIAL	DEPTH OF OVERBURDEN	DATE SAMPLED *	TYPE OF SAMPLE	DEPTH OF SAMPLE	> 3"	> 1"	1"	1/2"	NO. 4	NO. 10*	NO. 40*	NO. 200	LIQUID LIMIT	PLASTICITY INDEX	SWELL	A. A. S. H. O. CLASSIFICATION	WO/	W/	ABRASION 500 REV.	+4	-4

* SAMPLES TESTED AFTER MID-1963 USE NO. 8 AND NO. 50 SIEVES RESPECTIVELY.

SITES OUT OF SPECIFICATIONS

LOCATION								REPRESENTATIVE SAMPLE																										DOES NOT MEET SPECIFICATIONS FOR THE FOLLOWING TEST (S)
SITE NUMBER	TOWNSHIP	RANGE	40 ACRE TRACT	QUARTER SECTION	SECTION	OWNER	TYPE OF DEPOSIT	DATE SAMPLED	TYPE OF SAMPLE	DEPTH OF SAMPLE	SIEVE ANALYSIS									LIQUID LIMIT	PLASTICITY INDEX	IMMERSION COMPRESSION AVE. P.S.I		ABRASION 500 REV.	SODIUM SULPHATE LOSS		
											BEFORE CRUSHING		% PASSING AFTER CRUSHING TO 1 INCH MAXIMUM SIZE									LIME					
											>3"	>1"	1"	½"	No. 4	No. 10	No. 40	No. 200			WO/	W/		+4	-4	
07-A	11S	10E	N½	NE	34		Colluvium	1963	Test Hole		31.2	49.0	100	81.1	56.2	44.5*	21.0*	11.8	23.9	NP	21	93	37.0	21.5	26.6	Immersion-Compression and Na_2SO_4 loss.
07-B	11S	10E	SW	SE	27		Stream Channel	1963			0	19.0	100	75.6	48.3	36.8*	19.2*	9.2	22.5	NP	21	98	38.0	21.4	18.2	Immersion-Compression and Na_2SO_4 loss.
07-C	7S	8W	SE	SE	2	Service U.S. Forest	Shale Bedrock	1963			83.0	100	100	52.1	16.9	10.2*	4.6*	3.1	22.3	NP			30.0	26.7	16.1	Na_2SO_4 loss.
07-D	7S	8W	SW	NE	1	Service U.S. Forest	Shale Bedrock	1964			100		100	66.5	29.7	15.2*	6.0*	3.4	23.6	NP	170	219	34	51.1	63.3	Na_2SO_4 loss.
07-E	6S	7W	SE	SE	31	Service U.S. Forest	Sandstone Bedrock	1964	Cut Bank	0-25	100		100	50.9	22.9	13.8*	6.5*	4.1	21.5	NP	128	234	25.7	18.7	43.6	Na_2SO_4 loss.
07-F	5S	6W	N½	NE	28	Eyner Nielsen	Alluvial Fan	1961	Cut Bank	0-50	0	26.1	100	73.6	40.5	26.3	14.5	8.3	25.0	3.1			31.5			Weighted Na_2SO_4 loss of 38.2%.
07-G	5S	6W	NE	SW	11	Marvin Nielsen	Alluvial Fan	1961	Test Hole	0-5	8.8	15.0	100	76.6	39.5	24.1	13.1	7.5	25.4	NP			31.2			Weighted Na_2SO_4 loss of 38.2%.
07-H	4S	5W	SE	NW	31	Antelope Sheep Range Co.	Alluvial Fan	1961	Test Hole	0-5	2.0	9.1	100	75.7	45.7	29.5	16.2	8.8	22.3	NP			28.6			Weighted Na_2SO_4 loss of 38.2%.
07-I	4S	5W	NW	SE	21	Mont Paulson	Alluvial Fan	1961	Test Hole	0-10	0	5.5	100	80.0	47.7	32.8	17.5	9.4	22.6	NP			29.8			Weighted Na_2SO_4 loss of 38.2%.
07-J	3S	5W	S½	NW	32		Sandstone Bedrock	1967			100	Tested for Riprap												100		Na_2SO_4 loss.
07-K	1S	8W	NW	SW	13	June Roberts	Sandstone Bedrock	1966				Tested for Riprap											65.7	16.2		Wear and Na_2SO_4 loss.
07-L	1S	4W	NW	SW	30	Elwin W. Birch	River Terrace	1958	Cut Bank	0-12	24.3	47.5	100		50.0	42.5	32.8	6.8	18.9	NP			53.4			Wear.
07-M	4S	4W	SE SW	NE NW	2 1	Pearl Meacham	River Terrace	1960	Test Hole	0-5	4.7	31.7	100	82.9	56.5	48.1	37.9	19.8	20.9	4.1			30.8			Plastic Index.
07-N	10S	15E		W½	14	B.L.M.	Stream Channel	1967	Cut Bank	0-8	0	6.3	100	87.7	55.3	37.7*	14.3*	9.6	20	NP			72.6	33.3	52.5	Wear, Na_2SO_4 loss, and swell (.036).

* No. 8 and 50 sieves, respectively.